Human Systems Integration

Program Manager’s Briefing

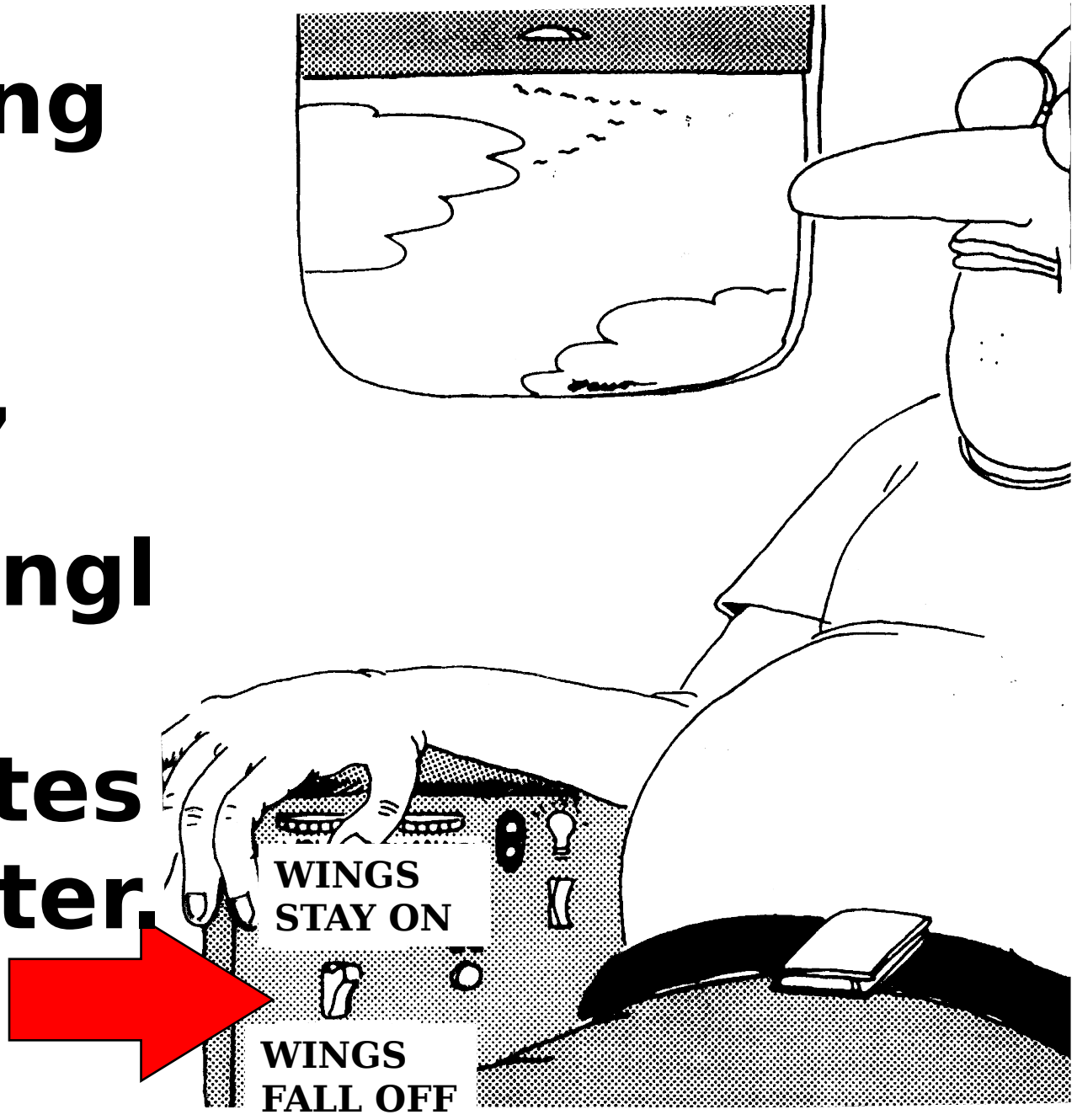
Purpose

- To provide information on human systems integration (HSI) and how it can benefit acquisition programs and projects.

Overview

- **Definition and Description of HSI**
- **Reasons to have a dynamic HSI program**
- **How to have a successful HSI program**

Fumbling for his recline button, Ted unwittingly instigates a disaster.



Human Systems Integration

Comprehensive management and technical effort to ensure total system effectiveness by continuous integration of all relevant information

DOMAINS/ELEMENTS

- **Manpower**
- **Personnel Capabilities**
- **Training**
- **Health Hazards**
- **Human Factors Engineering**
- **System Safety**
- **Survivability**

HSI DOMAINS

MANPOWER- number of military and civilian personnel required and potentially available to operate, maintain, sustain and provide training for systems

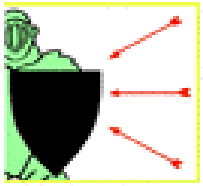
PERSONAL CAPABILITIES-cognitive and physical capabilities require to train, operate, maintain and sustain material and information systems

TRAINING-instruction, education, OJT, or unit training required to provide personnel and units with their essential job skills, knowledge, values and attitudes.

HUMAN FACTORS ENGINEERING- integration of characteristics into system definition, design, development and evaluation to optimize human-machine performance

HSI DOMAINS

SYSTEM SAFETY-design and operating characteristics of a system that minimize the human or machine errors or failures that cause accidents



SURVIVABILITY-characteristics of system that can reduce fratricide, detectability, and probability of attack, as well as minimizing system damage, personal injury, and cognitive and physical fatigue

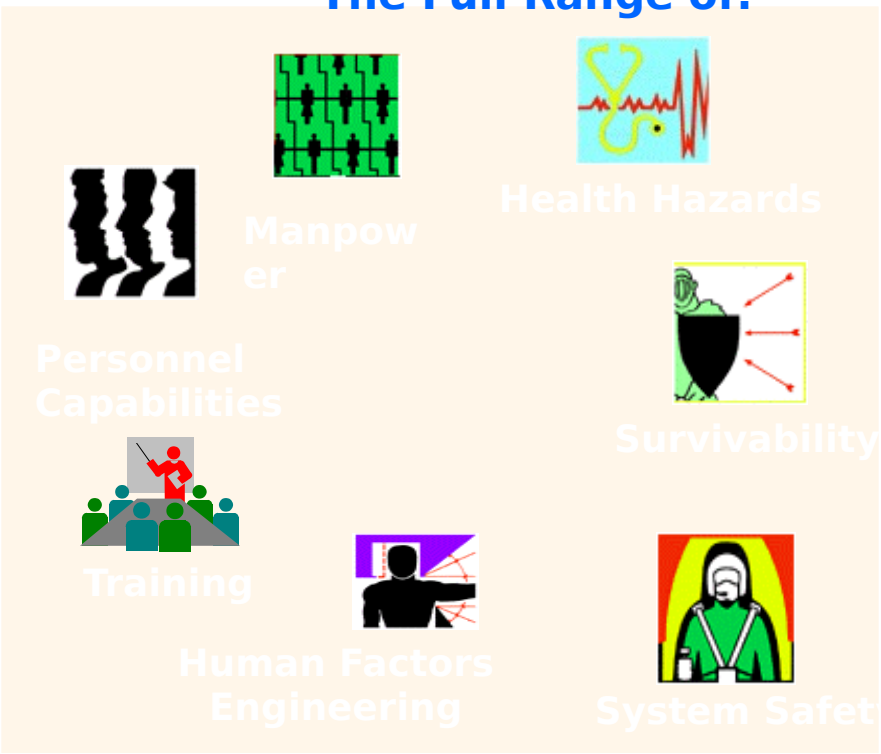
HEALTH HAZARDS- design and operating characteristics of a system that create significant risks of bodily injury or death; sources of health hazards include: loud noise, chemical and biological substances, extreme temperatures, and radiation energy.

HSI as Integrat

The System's Entire Life Cycle: Research, Development, Acquisition, Training, Operations & Disposal

Throughout

The Full Range of:



Reasons to have a Dynamic HSI program

HSI PAYOFFS

- **USER FRIENDLY EQUIPMENT is :**
  - **Easier to use, employ, and operate**
  - **Easier to maintain**
  - **Easier to supply and transport**
  - **Safer**
  - **More efficient**
  - **More cost effective**

HSI PAYOFFS

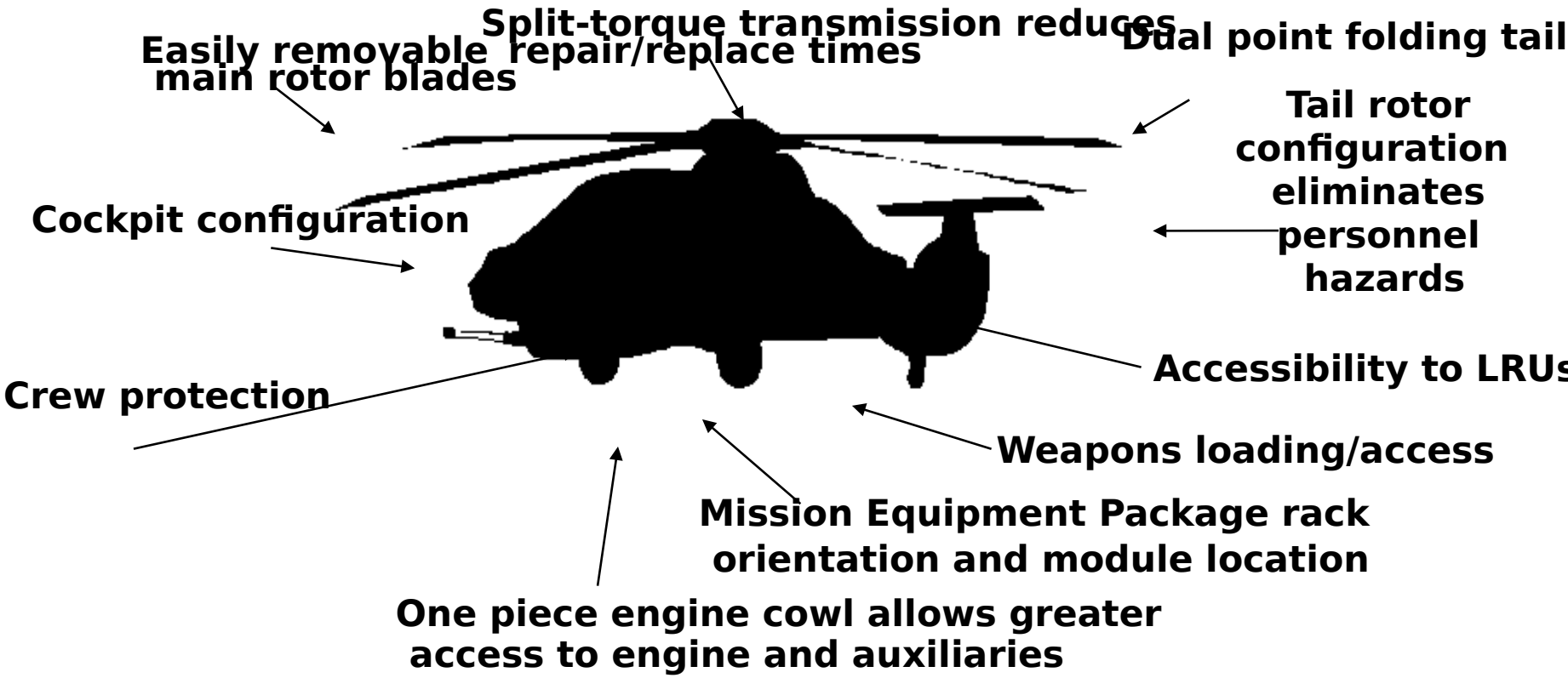
- Considering the needs of the operators, maintainers and supporters throughout the acquisition process ensures success when the system is fielded!
  - Users will have confidence in the equipment
  - No redesign necessary
  - No unexpected training, maintenance or supply problems
  - Reduced life cycle costs

Example from Army HSI Program

- The tool box for the T-53 series helicopter turbine engine (Huey & Iroquois) had 134 different tools.
- The tool KIT for the T-800 for the Comanche has **SIX** tools instead of **134**
  - Standard bolts throughout the engine provided the fix (some bolts “too” strong)
    - Results
      - Reduced workload for maintainer
      - Less burden on the supply system
      - Less training and inventory time
      - **Better combat readiness**

HSI Design Influence

Comanche helicopter


Easily removable main rotor blades
Split-torque transmission reduces repair/replace times
Dual point folding tail
Tail rotor configuration eliminates personnel hazards
Cockpit configuration
Crew protection
Accessibility to LRUs
Weapons loading/access
Mission Equipment Package rack orientation and module location
One piece engine cowl allows greater access to engine and auxiliaries

- ***Initial Required Program Buy - Life Cycle Cost avoidance > $3.29***

How to have a Successful HSI Program

- Form a HSI Integrated Product Team (IPT)
- Require the Contractor to have a HSI Program
- Include HSI considerations in your RFP and source selection criteria

HSI IPT

- Have HSI domain personnel work with you to identify, track and **resolve** HSI issues ***AS EARLY AS POSSIBLE*** in the acquisition process. By MS I 70% of all decision costs made!
- Ideally, all issues will be resolved ***as they arise***

Purpose of an HSI IPT

- Establish HSI plan of action and milestones
- Track HSI issues/risks with domain SME’s
- Establish milestones to resolve issues
- Identify/document actions taken

HSI in the RFP

- **The RFP is where the "rubber meets the road."** HSI issues should be incorporated into the RFP to ensure that contractors actually build the system for the user.
  - Incorporate HSI requirements into the Statement of Work (SOW).
  - Require Contractor specify plans for accomplishing the HSI program -- include as deliverables.
  - Identify appropriate HSI-related tests and evaluations.
  - Include detailed descriptions of required HSI data and reports.

The contractor’s proposal should demonstrate:

- How to implement HSI
  - Approach to identifying HSI issues/risks in system development and engineering.
  - Plans for ensuring continuous HSI coordination in system design efforts.
  - How to address training and develop an integrated system training plan.
  - Plans for integrating HSI into contractor's and for government’s test and evaluation.

Source Selection

- Must be tailored to your individual program!
- EXAMPLES
  - Possible Areas of Consideration (weighted to your program)
    - operator - system interface shall achieve simplicity of operation, maintenance and training
    - ease of assembly
    - simple controls and switches
    - training evaluation considers the amount of time to initially train and sustain proficiency

Operational testing

- Make sure that system can be operated, maintained and supported by the people who will be operating, maintaining, and supporting it when it’s fielded

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